

Application No. 09/955,385

upon receipt of a frame at the receiver, identifying a frame identifier for the received frame;

detecting, from the frame identifier, if a prior frame was missed or if a prior frame was received in error;

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if a missed prior frame or an errored prior frame is detected, sending a negative acknowledgment from the receiver to the transmitter, the negative acknowledgment including an indication of the missed prior frame or the errored prior frame;

if a negative acknowledgment is received at the transmitter, determining the frame identifier of the missed prior frame and resending the missed prior frame or the errored prior frame if a copy of the missed prior frame or the errored prior frame is still retained at the transmitter; and

releasing, independent of the acknowledgment of a successful receipt of the transmitted frame by the receiver, the retained copy of the transmitted frame when a storage constraint is reached.

26.(new) The method of claim 25, wherein the negative acknowledgment contains a frame identifier and a missing frame count that together identify one or more frames including the missed prior frame.

27.(new) The method of claim 25, further comprising sending a reminder frame from the transmitter to the receiver, to allow the receiver to detect a missed prior frame missing from an end of a frame sequence.

28.(new) The method of claim 25, further comprising including negative acknowledgment indications in frames containing data transmitted from the receiver to the transmitter when the receiver has data to send to the transmitter and has detected at least one missing prior frame.

29.(new) The method of claim 25, further comprising the steps of:
detecting when multiple network acknowledgments are sent for a single missed prior frame; and

sending only one retransmitted frame for each missed prior frame multiple network acknowledgment.

30.(new) The method of claim 25, further comprising:

the possibly unreliable channel being part of a network connecting a plurality of transmitters and a plurality of receivers;

a source identifier and a destination identifier being included in each frame transmitted from a source transmitter; and

selectively processing, at a destination receiver, those frames having a destination identifier identifying the destination receiver.

31.(new) The method of claim 30, wherein the destination identifier identifies a plurality of broadcast receivers, the method further comprising broadcasting a frame sent from the sender by including, in the frame, the destination identifier identifying the plurality of broadcast receivers.

32.(new) The method of claim 25, wherein the storage constraint is either a time constraint, where frames are released after a buffer period, or a storage constraint, wherein an oldest frame is released when a new frame is to be stored in the frame buffer and the frame buffer is full.

33.(new) The method of claim 25, wherein the sender transmits the transmitted frame to more than one receiver.

34.(new) The method of claim 25, wherein the set of frame identifiers is a set of sequential integers and the frame identifiers are used in sequence and transmitted in sequential frame order.

35.(new) The method of claim 25, wherein the indication of the missed prior frame is a network acknowledgment containing a frame identifier and a missing frame count that together identify one or more frames including the missed prior frame.

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36.(new) The method of claim 25, further comprising the steps of: identifying, at the receiver, when frames are received out of order; and when a frame is received out of order, buffering the out of order frame in a receiver buffer for a receive buffer period, until preceding frames are received or the receive buffer period.

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37.(new) The method of claim 25, wherein the channel is a bidirectional channel and each node on the channel sends and receives frames.

38.(new) The method of claim 25, further comprising the steps of: assigning a priority to each frame being transmitted, the priority selected from a set of priorities; and handling frames of differing priorities with differing logical channels.

39.(new) The method of claim 25, wherein the channel is one of a telephone wire, a cable, a radio frequency link or a power wire.

40.(new) The method of claim 25, wherein the indication of the missed prior frame includes a frame identifier of a first missed frame and a number of sequential missed frames following the first missed frame.

41.(new) The method of claim 25, wherein the frame identifiers are reusable frame identifiers.

42.(new) The method of claim 25, wherein the step of storing contents of the frame is a step of storing contents of the frame for a buffer period.

43.(new) The method of claim 42, further comprising tracking a buffer period for each frame.

44.(new) A frame-switched network apparatus comprising:

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a transmitter for sending frames formed at a transmitter and containing data to be transmitted from the transmitter over a possibly unreliable channel, the transmitter having transmitter control logic for controlling the sending from the transmitter to the receiver over the possibly unreliable channel, independent of a presence of the receiver on the possibly unreliable channel or any explicit channel control initialization between the transmitter and the receiver and without an expectation of an acknowledgment of a successful receipt of the transmitted frame by the receiver, a frame having a frame identifier selected from a set of frame identifiers, the transmitter control logic controlling retaining a copy of the frame at the transmitter; and

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a receiver for receiving the frames transmitted over the possibly unreliable channel, the receiver having receiver control logic controlling receipt of a frame at the receiver, identifying the frame identifier for the received frame, detecting, from the frame identifier, if a prior frame was missed or if a prior frame was received in error, controlling sending a negative acknowledgment from the receiver to the transmitter if a missed prior frame or an errored prior frame is detected, the negative acknowledgment including an indication of the missed prior frame or the errored prior frame;

the transmitter control logic determining upon a negative acknowledgment being received at the transmitter the frame identifier of the missed prior frame or errored prior frame and resending the missed prior frame or the errored prior frame if a copy of the missed prior frame or the errored prior frame is still retained at the transmitter, and releasing, independent of an acknowledgment of a successful receipt of the transmitted frame by the receiver, the retained copy of the transmitted frame when a storage constraint is reached.

45.(new) The frame-switched network apparatus of claim 44, wherein the negative acknowledgment contains a frame identifier and a missing frame count that together identify one or more frames including the missed prior frame.

46.(new) The frame-switched network apparatus of claim 44, further comprising negative acknowledgment indications in frames containing data transmitted from the receiver to the transmitter when the receiver has data to send to the transmitter and has detected at least one missing prior frame.

47.(new) The frame-switched network apparatus of claim 44, wherein:
the possibly unreliable channel is part of a network connecting a plurality of
transmitters and a plurality of receivers;
a source identifier and a destination identifier is included in each frame transmitted
from a source transmitter; and
those frames having a destination identifier identifying the destination receiver are
selectively processed at a destination receiver.

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48.(new) The frame-switched network apparatus of claim 47, wherein the
destination identifier identifies a plurality of broadcast receivers, and a frame sent from the
sender includes in the frame the destination identifier identifying the plurality of broadcast
receivers .

49.(new) The frame-switched network apparatus of claim 44, wherein the
indication of the missed prior frame includes a frame identifier of a first missed frame and a
number of sequential missed frames following the first missed frame.

50.(new) The frame-switched network apparatus of claim 44, wherein the storage
constraint is either a time constraint, where frames are released after a buffer period, or a
storage constraint, wherein an oldest frame is released when a new frame is to be stored in
the frame buffer and the frame buffer is full.

51.(new) The frame-switched network apparatus of claim 44, wherein the sender
transmits the transmitted frame to more than one receiver.

52.(new) The frame-switched network apparatus of claim 44, wherein the set of
frame identifiers is a set of sequential integers and the frame identifiers are used in sequence
and transmitted in sequential frame order.

53.(new) The frame-switched network apparatus of claim 44, wherein the
indication of the missed prior frame is a network acknowledgment containing a frame